

Applicants : John P. Drummond and Niall R. Lynam
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Amendments to the Specification:

Please amend the paragraph beginning on line 14 of page 1 as follows:

Various forms of vehicle communication systems have been developed including wired networks, or busses, operating one of several known protocols. These include a LIN (Local Interconnect Network), a LAN (Local Area Network), a CAN (Car or Controlled Area Network), and the like. An advantage of such vehicle networks is that the wire harness to the mirror can be minimized to as few as three wires or so, yet provide a variety of functions. Wireless communication networks utilizing radio frequency and/or infrared communication for vehicles have also been proposed, such as those utilizing the BLUETOOTH protocol. Such wireless communication and the BLUETOOTH protocol are described in more detail in commonly assigned U.S. patent application Ser. No. 09/793,002, filed Feb. 26, 2001, entitled VIDEO MIRROR SYSTEMS INCORPORATING AN ACCESSORY MODULE, now U.S. Pat. No. 6,690,268, the disclosure of which is hereby incorporated herein by reference.

Please amend the paragraph beginning on line 27 of page 2 as follows:

According to another aspect of the invention, a vehicle rearview mirror system includes an interior rearview mirror system made up of an electrochromic reflective element, a housing for the electrochromic reflective element and a circuit board in the housing. The electrochromic reflective element assumes a partial reflectance level in response to a drive signal. A digital electrochromic drive circuit is provided on the circuit board and supplies a drive signal to the reflective element. The mirror system further includes a garage door opener. The garage door opener includes a transmitter and a logic circuit, at least one of which (and preferably, both) is on the circuit board, and share components with, the electrochromic drive circuit. The logic circuit supplies signals to the transmitter for transmitting garage door opening signals. The garage door opener may, optionally and preferably, also serve as a receiver or a transceiver for a tire pressure status monitoring/display system, such as disclosed in commonly assigned U.S. patent application

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Scr. No. 09/513,941, filed Feb. 28, 2000, entitled TIRE INFLATION ASSISTANCE MONITORING SYSTEM, now U.S. Pat. No. 6,294,989, and U.S. patent application Ser. No. 09/710,016, filed Nov. 10, 2000, entitled TIRE INFLATION ASSISTANCE MONITORING SYSTEM, now U.S. Pat. No. 6,445,287, the disclosures of which are hereby incorporated herein by reference, and thus have a dual tire pressure monitoring/display and garage door opener function. The mirror system further includes a microcontroller which defines, at least in part, the digital drive circuit and the logic circuit. The digital electrochromic mirror system has components in common with the garage door opener. The microcontroller communicates over a vehicle network with at least one module performing at least one other vehicle function.

Please amend the paragraph beginning on line 7 of page 4 as follows:

Digital electrochromic mirror system 18 further includes a bus interface 32 which interfaces with a vehicle network, or bus, 34. Items on network 34 can be connected by wired or wireless connection. Wired connection may include wire, cables, fiber-optic cables, and the like. Wireless connection can be by infrared (IR) or radio-frequency (RF) communication, and, preferably, may be a short-range RF interconnection using the BLUETOOTH protocol. Vehicle network, or bus, 34 may utilize various buss protocols including a Local Internet Network (LIN), a Local Area Network (LAN), a Car (a/k/a Controlled) Area Network (CAN), or other vehicle network protocol. The BLUETOOTH protocol is a low-cost, low-power radio-based cable replacement or wireless link based on short-range radio-based technology. BLUETOOTH enables creation of a short-range (typically 30 feet or so, although longer and shorter ranges are possible), wireless personal area network via small radio transmitters built into various devices. For example, transmission can be on a 2.45 gigahertz band, moving data at about 721 kilobits per second, or faster. In the illustrated embodiment, network 34 is a multi-drop bus which requires three or fewer wires for communication between a plurality of other vehicle functions 36, as illustrated in Fig. 3. In situations where timing and power consumption system constraints may cause network 34 wakeup time to be too slow for an automobile maker system response

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requirement, suitable adjustments may be made in the architecture of network 34. The network may be configured as disclosed in commonly assigned U.S. patent application Ser. No. 09/341,450 filed July 8, 1999, by Drummond et al. for a VEHICLE REARVIEW MIRROR AND A VEHICLE CONTROL SYSTEM INCORPORATING SUCH MIRROR, now U.S. Pat. No. 6,291,905, the disclosure of which is hereby incorporated herein by reference.

Please amend the paragraph beginning on line 29 of page 4 as follows:

Other vehicle functions 36 include, by way of example, a seatbelt warning status 38, which status may be displayed on a mirror-based display 40. Preferably, mirror-based display 40 may be located on, at or adjacent interior rearview mirror assembly 16. Mirror-based display 40 may be of various forms including that disclosed in commonly assigned U.S. patent application Ser. No. 09/799,414, filed on Mar. 5, 2001, by McCarthy et al., entitled COMPLETE MIRROR-BASED GLOBAL-POSITIONING SYSTEM (GPS) NAVIGATION SOLUTION, now U.S. Pat. No. 6,477,464, the disclosure of which is hereby incorporated herein by reference. Additionally, display 40 may display magnetic vehicle heading information from a magnetic sensor 42, the information being supplied over network 34. Additionally, reverse gear status from a reverse gear sensor 44 may be supplied over network 34 to cause digital electrochromic mirror 18 to assume a high reflectance level when vehicle 11 is placed in reverse gear. Rearview mirror system 10 may additionally receive engine information 46 and/or door opener information at 48 over network 34 and activate general lighting 50 located in, at or on interior rearview mirror assembly 16, such as when a door of vehicle 11 is opened. Status from an alarm assembly 52 may also be conveyed over network 34 and displayed by display 40.

Please amend the paragraph beginning on line 21 of page 5 as follows:

The interior rearview mirror assembly includes microcontroller 20 and a printed circuit board 61, that are common to both the digital electrochromic mirror system 18 and

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garage door opener function 66. Sharing of components and circuit board space can facilitate a reduction of susceptibility to RF/EMI interference and reduce cost and avoid duplication of both the network interface hardware 32, communication software and some processing power. The interior rearview mirror assembly may also include a video display system, such as disclosed in commonly assigned U.S. patent application Ser. No. 09/793,002, filed Feb. 26, 2001, entitled VIDEO MIRROR SYSTEM INCORPORATING AN ACCESSORY MODULE, now U.S. Pat. No. 6,690,268, the disclosure of which is hereby incorporated herein by reference. Components may be shared between the video display system, the digital electrochromic mirror system and/or the garage door opener. Additionally, microcontroller 20 may control a forward-facing camera system and headlight control which may also share components with the digital electrochromic mirror system and/or the garage door opener. Such forward-facing camera system and headlight control may be of the type disclosed in commonly assigned U.S. Pat. 5,796,094 entitled VEHICLE HEADLIGHT CONTROL USING IMAGING SENSOR, the disclosure of which is hereby incorporated herein by reference. An imaging sensor based rain sensor of the type disclosed in commonly assigned U.S. patent application Ser. No. 09/530,306, filed Apr. 27, 2000, entitled RAIN SENSOR WITH FOG DISCRIMINATION, now U.S. Pat. No. 6,353,392, may also be incorporated in circuit board 61 and share components with the digital electrochromic mirror system and/or the garage door opener.

Please amend the paragraph beginning on line 7 of page 6 as follows:

With microcomputer 20 driving digital electrochromic mirror system 18, and with vehicle status information available over network 34, it is possible to have a circuit assembly 61 in or at interior rearview mirror assembly 16 that is powered by a battery 62 that is separate from the vehicle ignition storage battery. As an example, battery 62 may be of a long-life lithium type battery. Moreover, because of its relatively small size, battery 62 may be recharged by a separate dedicated solar-powered rechargeable battery source 64 of the type described in commonly assigned patent application Ser. No. 09/793,002, filed Feb. 26, 2001, entitled VIDEO MIRROR SYSTEMS INCORPORATING AN ACCESSORY

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MODULE, now U.S. Pat. No. 6,690,268, the disclosure of which is hereby incorporated herein by reference. By powering mirror system 10 by a separate-dedicated solar-powered rechargeable battery source, mirror system 10 can consume power from its dedicated/local battery source, and any power used up during nighttime hours can be replenished by day via solar cell/panel that is a part of battery charger 64 and is connected to the dedicated battery 62 so as to recharge/charge during daytime hours. Furthermore, microcomputer 20 can be put into various power-saving modes thereby enabling electronic assembly 61 to be used for control of a garage door opener 66, such as a HOMELINK™ unit or the universal home access KWIKLINK™ unit.

Please amend the paragraph beginning on line 23 of page 6 as follows:

Also, a mirror-mounted microphone/digital sound-processing system 68, as disclosed in commonly assigned patent application Ser. No. 09/466,010, filed by DeLine et al., on Dec. 17, 1999, for an INTERIOR REARVIEW MIRROR SOUND-PROCESSING SYSTEM, now U.S. Pat. No. 6,420,975, the disclosure of which is hereby incorporated herein by reference, may be also powered by battery 62. Preferably, sound-processing system 68 is incorporated in circuit assembly 61 and, most preferably, shows microcontroller 20 with garage door opener 66 and digital electrochromic mirror 18. Communication button press information 58 can be transmitted over network 34 for various uses by other electronic control units, such as activation of a rescue system 60, such as General Motors' ONSTAR™ system, a Ford Motor Company's RESCUE™ system, or the like. Use of digital signal-processing and a single mirror-mounted microphone (such as is described in U.S. patent application Ser. No. 09/396,179, filed Sep. 14, 1999, entitled INDICATOR FOR VEHICLE ACCESSORY, now U.S. Pat. No. 6,278,377, the disclosure of which is incorporated by reference herein) is particularly advantageous for economical achievement of clear and error-free transmission from the vehicle, while operating along a highway, to a remote receiver, particularly in speech-recognition mode. This use of network 34 facilitates location of button 58 in interior mirror assembly 16.

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Please amend the paragraph beginning on line 17 of page 7 as follows:

Other functions may be controlled over network 34 such as remote keyless entry 74 and global positioning system information/navigational system as described in commonly assigned co-pending application Ser. No. 09/799,414, filed on Mar. 5, 2001, by McCarthy et al., entitled COMPLETE MIRROR-BASED GLOBAL-POSITIONING SYSTEM (GPS) NAVIGATION SOLUTION, now U.S. Pat. No. 6,477,464, the disclosure of which is hereby incorporated herein by reference.